

1 1. For use in transforming colors between color
2 imaging systems, a color mapping method comprising:

3 using forward transformation profiles that
4 characterize the color imaging systems to generate
5 respective sets of device-independent color values for the
6 color imaging systems;

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7         calculating color conversions by recursively
8     reducing differences between the sets of device-independent
9     color values; and

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10      constructing a color map describing a relationship
11  between the color imaging systems using the color
12  conversions.

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1 2. A color mapping method, according to claim 1,
2 further comprising recursively reducing differences between
3 black channel information.

1 3. A color mapping method, according to claim 1,
2 further comprising using an error function for calculating
3 the color conversions.

1 4. A color mapping method, according to claim 1,
2 further comprising configuring at least one of the profiles

3 to account for certain perceptual effects on color
4 appearance.

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1 5. A color mapping method, according to claim 1,
2 wherein the color map comprises at least one of the
3 following: a lookup table, and an equation.

1 6. A color mapping method, according to claim 1,
2 further comprising:

3 storing the color map;

4 detecting respective types of color imaging
5 devices between which a color transformation is to be
6 performed; and

7 in response to the detected types, selecting a
8 stored color map.

1 7. For use in transforming colors between source
2 and destination color imaging systems, a color mapping
3 method comprising:

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4 using profiles that characterize the color imaging
5 systems to generate device-independent color values for the
6 source color imaging system, the device-independent color

7 values having a same dimensionality as the source color
8 imaging system;
9 using the profiles to perform a color conversion
10 for converting the device-independent color values to
11 device-dependent values of the destination color imaging
12 system; and
13 using the color conversion to define a color map
14 for transforming colors between the color imaging systems.

1 8. A color mapping method, according to claim 7,
2 wherein the color conversion is performed at least twice.

1 9. A color mapping method, according to claim 7,
2 further comprising:

3 using the color conversion to evaluate its
4 accuracy at least once; and

5 revising the color conversion at least once to
6 improve its accuracy.

1 10. For use in transforming colors between source
2 and destination color imaging systems, a color mapping
3 method comprising:

5 respective sets of device-independent color values for the
6 color imaging systems;
7 means for calculating color conversions by
8 recursively reducing differences between the sets of device-
9 independent color values; and
10 means for constructing a color map describing a
11 relationship between the color imaging systems using the
12 color conversions.

1 12. For use in transforming colors between first
2 and second color imaging systems respectively using first
3 and second color coordinate systems, a color mapping method
4 comprising:

5 (a) generating first device-independent color
6 coordinates as a function of color coordinates in the first
7 color coordinate system;

8 (b) estimating preliminary color coordinates in
9 the second color coordinate system;

10 (c) generating second device-independent color
11 coordinates as a function of the preliminary color
12 coordinates;

13 (d) adjusting the preliminary color coordinates
14 to reduce an error between the first and second device-
15 independent color coordinates;

16 (e) returning to step (a) until the error
17 satisfies a quality threshold; and

18 (f) constructing a color map describing a
19 relationship between the first and second color imaging
20 systems as a function of the adjusted color coordinates.

1 13. A color mapping method, according to claim
2 12, further comprising using the color coordinates in the
3 first color coordinate system to estimate the preliminary
4 color coordinates.

1 14. For use in transforming colors between color
2 imaging systems, a color mapping arrangement comprising:

3 a computer arrangement, programmed to

4 use forward transformation profiles that
5 characterize the color imaging systems to generate
6 respective sets of device-independent color values for the
7 color imaging systems,

1 18. A color mapping arrangement, according to
2 claim 14, wherein the computer arrangement is further
3 programmed to
4 detect respective types of color imaging devices
5 between which a color transformation is to be performed, and
6 in response to the detected types, select a stored
7 color map.

1 19. For use in transforming colors between color
2 imaging systems, a data storage medium storing a computer-
3 executable program that, when executed,

4 uses forward transformation profiles that
5 characterize the color imaging systems to generate
6 respective sets of device-independent color values for the
7 color imaging systems;

8 calculates color conversions by recursively
9 reducing differences between the sets of device-independent
10 color values, and

11 constructs a color map describing a relationship
12 between the color imaging systems using the color
13 conversions.

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1 20. A data storage medium, according to claim 18,
2 wherein the computer-executable program recursively reduces
3 differences between black channel information.

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1 21. A data storage medium, according to claim 18,
2 wherein the computer-executable program uses an error
3 function for calculating the color conversions.

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1 22. A data storage medium, according to claim 18,
2 wherein the computer-executable program configures at least
3 one of the profiles to account for certain perceptual
4 effects on color appearance.

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1 23. A data storage medium, according to claim 18,
2 wherein the computer-executable program generates at least
3 one of the following: a lookup table, and an equation.

1 24. A data storage medium, according to claim 19,
2 wherein the computer-executable program:
3 stores the color map;
4 detects respective types of color imaging devices
5 between which a color transformation is to be performed; and

- 6 in response to the detected types, selects a
- 7 ~~stored color map.~~

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